SCOPE FOR REHABILITATION
BRIDGE NO. 03313
I-84 TR 815 OVER I-84 EB, ROUTE 72 WB, ROUTE 372, B&M RAILROAD, AND QUINNIPIAC RIVER
CITY OF NEW BRITAIN

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Bridge No. 03313 is a nine span bridge consisting of a steel multi-girder superstructure with a reinforced concrete deck on a pile supported substructure. This structure, built in 1969, carries I-84 TR 815 over Route 72 Westbound, Route 372, B&M Railroad, and the Quinnipiac River in New Britain, Connecticut. The substructure consists of reinforced concrete abutments, hammerhead piers with post-tensioned caps, and an isolated pier bent with a steel girder cap with fixed hinge girder connections. The structure has various span lengths with a maximum span length of 109 feet and an overall length of 928 feet. The curb-to-curb width is 27.8 feet, which is slightly less than the approach roadway width of 28 feet, and the overall deck width is 31.5 feet. The 2010 Average Daily Traffic (ADT) on the bridge is 17,815 vehicles. The 2012 ADT on Route 72 WB and Route 372 is 25,750 and 9,700 vehicles, respectively.

The reinforced concrete deck is in satisfactory condition (Overall Rating = 6). The bituminous concrete overlay exhibits cracking throughout and the paving seams are open up to ½" wide. The asphaltic plug joints have cohesion and adhesion cracks up to the full lengths of the joints x up to 4.5" wide. There are joint plates exposed at random wide cracks and at a 1.5' x 8" wide x 1" deep pothole at the north abutment joint. The underside of the deck shows cracking with efflorescence and isolated honeycomb areas and end haunch spalls. The underside deck deterioration is approximately 4.9%. The parapets have areas of severe scaling throughout with isolated areas of exposed rebar. There are bent sections of pipe rail and the posts are slightly tipped at areas of impact damage. The scupper pans along the east shoulder have heavy laminated rust and there is evidence of leakage to the superstructure below.

The superstructure is in poor condition (Overall Rating = 4). The steel girders have areas of peeling paint with moderate to heavy rust. There is section loss in the girder webs and web stiffeners up to 8" x 3" x 3/16" deep. The girder bottom flanges have section losses up to 3/8" deep x 7" wide at several locations in critical areas. There are gaps between the pads and pedestals up to 1/8" at isolated locations. Some of the fixed bearings exhibit moderate to heavy rust and up to ½" impacted rust. Isolated anchor bolts are tipped and there is up to 80% section loss on anchor bolt nuts. The sliding bearing at the steel pier cap girder end appears to be frozen. Hinges at this pier have up to 9/16" impacted rust between hinge plate and girder web with bleeding rust, mainly at the fascia girders. Random pin nuts are not seated square on the plate leaving gaps up to 9/16" under the nuts. Several cotter pins are missing, but the tack welds are in place. As part of State Project No. 171-198, a back-up assembly was installed which consisted of 12-inch beams bolted to the bottom flange of the girders and bolted to the web of the pier cap girder (drawings attached).

The reinforced concrete abutments and piers are in fair condition (Overall Rating = 5). Both of the abutment stems exhibit cracks up to 1/16" wide and there are spalls up to 1.5' x 6" x 1" deep with exposed rebar. The north abutment footing is exposed on the east end for 60" long x 5" wide x 4" deep and the pier 5 footing is exposed up to 12' long x 5' wide x 2' deep along the south side. The concrete pier caps have cracking with efflorescence. There are hollow areas up to full height x 1.5' and spalls up to 1' x 1' x 4" deep. There is a 1' long x 3" high x 2" deep void that slightly undermines pedestal 4 on pier 2 and there is a 8" x 8" x 2" deep spall that undermines pedestal 4 on pier 7. The grout pockets for the post tensioning anchorages typically have cracks up to ¼" wide with efflorescence along the perimeter, hollow areas up to 2' x 2', and spalls or scale up to 2' x 6" x 3" deep. The concrete pedestals

have cracks up to ¼" wide, with some through the anchor bolt lines, spalls up to 10" x 1.5" x 1.5" deep, and hollow areas up to 2' high x full width. The steel girder pier cap at pier 1 has light to moderate rust on the interior portions. The bottom flange at the south elevation near girder 4 has a 6" wide x 3/16" deep area of section loss, and the web stiffener at this location has a 1" x 2" hole along the bottom at this location.

RECOMMENDED REHABILITATION

Based on field inspection of the existing structure the following rehabilitation measures are recommended:

- Replace joints over abutments and piers
- Repair deck ends at each joint
- Mill deck, full and partial depth deck patch
- Place new membrane waterproofing and bituminous concrete across entire deck
- Clean and paint beam ends and bearing devices
- Repair substructure as necessary
- Modify bridge parapet with concrete cap
- Repair parapet as necessary
- Update guiderail at southeast approach
- Cover exposed abutment and pier footing
- Paint south fascia girder over I-84 EB
- Repair superstructure steel as necessary
- Clean, paint and lubricate frozen expansion bearing at steel girder pier cap

The proposed rehabilitation will be performed utilizing temporary lane shifts of the ramp. A 12-foot travel lane will be provided for each stage of construction. Each stage will consist of milling the existing bituminous concrete overlay and membrane waterproofing, full and partial depth deck patching, repairing the deck ends, placing new membrane and bituminous concrete overlay and placing a new asphaltic plug expansion joint, half the bridge at a time. Temporary precast concrete barrier curb will be used to provide positive protection between the work area and travel lanes when repairs are being performed.

Cleaning and painting of the beam ends and bearing devices can be performed with no interruptions to traffic on Bridge No. 03313. Interruptions to Route 72 WB traffic are anticipated to perform superstructure repairs and substructure repairs to the south abutment and pier 1. The hammerhead pier cap end repairs will require temporary support and shoulder closures due to the proximity of the post tensioning end load plates. Coordination with the railroad will be required for work on piers 4 and 5 and the superstructure spanning across the tracks. Interruptions to Route 372 are anticipated to perform work at pier 5. Work on the superstructure over I-84 EB will require night time lane closures to set up appropriate protection.

The Quinnipiac River, which runs under the structure between the railroad and Route 72, will not be impacted as a result of this project. This section of the river is located outside a FEMA delineated floodway; therefore, it is anticipated that there will be no environmental permits needed for this project.